

# Morgan County

## North Morgan Transportation Study



FINAL REPORT  
April 7, 2004



# **North Morgan County Transportation Planning Study**

## **1.0 Background**

Morgan County is largely privately owned, with very little public land. Many of the landowners are making plans to develop their land. The largest pressure for development is in the Mountain Green area. The county, in an effort to be proactive, has identified in the General Plan the need for a new, or improved interchange in Mountain Green area. This study is being done primarily because of the development pressure and the county's desire to plan for future growth. This study will serve as a supplement to the General Plan with regard to some transportation and growth issues.

### **1.1 Beginnings of Study**

Morgan County officials have had a long-standing desire to have a transportation study conducted in the Mountain Green area. This was accentuated during the 2002 Winter Olympics, when a great deal of traffic was required to use the Mountain Green Interchange on I-84, and the Trappers Loop Road (State Hwy. 167), which leads to the Snow Basin Ski Resort, and the Ogden Valley. In 2003, the Wasatch Front Regional Council (WFRC) received a limited amount of funding from the 21<sup>st</sup> Century Communities Program, the purpose of which is to assist rural communities of the state to accomplish more planning. Morgan County is a member of the Wasatch Front Regional Council, and the decision was made to use part of these funds to assist the County in addressing the transportation issues of Mountain Green, which is the fastest growth area in Morgan County. Also, the Utah Department of Transportation (UDOT) has a program to assist rural communities with the development of transportation plans. Considering the availability of these resources, and the needs of Morgan County for a planning study in the Mountain Green area, the WFRC and UDOT decided to team up to accomplish the North Morgan Transportation Planning Study.

### **1.2 Planning Process for this Study**

Since the amount of funds available for this planning study is limited, the scope of work by necessity was developed with this funding constraint in mind. The study was designed to be accomplished within about a 60-day time frame. It is a cooperative venture between Morgan County, UDOT, and the WFRC. Morgan County provided the land use, population, economic, and planning information that was used to build the study's database. UDOT conducted some travel demand analyses for the Mountain Green Interchange, I-84, Trappers Loop Road, and a few other roadways, and some preliminary engineering with regard to possible interchange designs. UDOT and the WFRC, with the cooperation of Morgan County, jointly developed the interchange alternatives that the study considered. The WFRC collected and evaluated the existing and projected future population and land use and development data. The WFRC, with the assistance of Morgan County also organized the stakeholders meetings for the study. The documentation and mapping of the study was a shared responsibility between UDOT and the WFRC.

### **1.3 Study Area**

The study area includes primarily the northern portion of Morgan County, centered around the Mountain Green area. To the north the study area extends along the Trappers Loop Road corridor, which includes the Snow Basin and other areas on either side of Trappers Loop Road. Closer to I-84 and the Mountain Green Interchange, the study area includes the community of Mountain Green and surrounding areas. To the east, the study area includes the Cottonwood drainage area where the airport and the Browning Arms factory are located. Lastly, the study area also extends into the Morgan Valley as far south as Morgan City, and some of the foothills adjacent to the valley.

### **2.0 Purpose of Study**

The purpose of this transportation planning study is to generally evaluate the transportation needs of the northern portion of Morgan County. More specifically, the study intends to identify the most important transportation needs in the northern portion of Morgan County, or the “greater” Mountain Green area, and identifies ways those needs could be met. It focuses primarily on the Mountain Green Interchange and the issues associated with it, Trappers Loop Road (State Hwy. 157), and the effects of future growth on the existing interchange and study area. Alternative solutions will be identified and recommendations will be made, which will enable local planning officials to make long-range plans for future land use and development, and the instigation of measures that will allow for corridor preservation of future transportation facilities.

### **3.0 Summary of Existing Conditions**

The Mountain Green Master Plan has a description of the area in general terms. This section of the supplemental report will focus on the most recent data available. This supplemental report will also focus attention on the data as relates to the interchange and the area around it.

#### **3.1 Traffic**

UDOT has a permanent count station installed on I-84 between the Mountain Green Interchange and the Peterson Interchange. The Average Annual Daily Traffic (AADT) reported from that count station is 12,300. I-84 west of Mountain Green is carrying about 17,300 vehicles per day. A new permanent count station was installed prior to the 2002 Winter Olympic Games on SR-167 just East of the Mountain Green Interchange. The AADT from that station is about 5,700. Recent counts on the Mountain Green Interchange ramps show a daily traffic volume of approximately 2,500 on each ramp. The highest hourly traffic volumes over the entire year on SR-167 and the ramps are about 800 vehicles per hour. This equates to about 50% of the capacity of the ramps and SR-167. Similarly, all of the other highways in the study area are currently operating at about 30% to 50% of their maximum capacities. The following map illustrates both existing and future daily traffic which will be discussed in the next section.

#### **3.2 Environmental**

Spatially, Morgan County is one of the smaller counties in Utah and is located in the area of the “Wasatch Back”, which is just east of the Wasatch Front Range of mountains. The heart of the county is a mountain valley called Morgan Valley, which is a relatively narrow fluvial valley that has been shaped by the Weber River and several tributary creeks and streams that flow from the surrounding

hills and mountainsides. Very scenic mountains ranging in elevation between 8,000-10,000 feet surround the valley, which is about 4,900 feet in elevation. Most of the people live, and agricultural activities take place in the valley. The Weber River is the major water feature of the valley and a major source of water for the northern Utah area. Numerous wetland areas that can be found in the flood plain, particularly north of the community of Petersen and west of the area where the Weber Canyon begins to narrow, that are frequented by, and provide habitat for numerous wildlife species, accompany the Weber River. The surrounding mountains, which are mostly privately owned, also provide valuable habitat for a variety of species, particularly elk and deer. The mountains receive a considerable amount of precipitation during the winter and early spring months, much of it in the form of snow. Average temperatures in the valley range between the low 20s in winter and the low 70s in summer in degrees F. The climate in the valley is considered to be a steppe, or semi-arid. The mountains are primarily covered with grasses, scrub oak and conifers, depending on the slope orientation.

More environmental, as well as historical and other background information, can be obtained by consulting the *Morgan [County] General Plan (2000)*, and in the *Mountain Green Master Plan (2000)*.

### **3.3 Land Use/Population**

The only incorporated community in Morgan County is Morgan City, which is the county seat. The city had a population of 2,635 people as reported by the 2000 Census. The growth in Morgan City has been relatively slow to moderate over the years, and therefore, the city may not have many more people than what was reported by the Census. On the other hand, the unincorporated community of Mountain Green has had a relatively higher growth rate and could actually be larger than Morgan City. The Morgan City and Mountain Green are the two most significant concentrations of population in Morgan County. However, there are several smaller unincorporated communities in the Morgan Valley with populations of several hundreds, or smaller. These are: Littleton, North Morgan, Stoddard, Milton, Enterprise, and Petersen. The population of all of Morgan County was reported to be 7,181 by the 2000 Census. Today, it is estimated to have a population of about 7,400 people.

Morgan County is predominantly a rural county. Most of its land use is dedicated to agriculture and open space, most of which is privately owned. Most of the remainder of the county is in residential land use. There are a few commercial businesses in the county, which are primarily located in Morgan City. Morgan's commercial development is located in two distinct areas. One commercial district is located on along the Frontage Road next to the railroad tracks and close to the freeway. This is the old commercial district of Morgan. Another distinct district is in the form of strip commercial development fronting SR-66, which runs through the middle of the city. There is also a limited amount of institutional, or government land use, such as Morgan High School and other schools, City Hall, and the County Courthouse, which are all in Morgan City. Mountain Green has virtually no commercial development. Its most prominent commercial development is the convenience store located in the northwest corner of 5800 Old Hwy. Road and SR-167 (Trappers Loop Road). There are also a bank and a small service oriented strip mall in the same general area. As far as industrial development is concerned, the Browning Arms plant and the Cottonwood

Commercial Park, by the Morgan Airport, are the only developments of this type located in the northern portion of Morgan County.

### **3.4 Freight Movement**

Aside from local deliveries to stores and businesses, freight is not a major factor in Mountain Green or the area covered by the Morgan Transportation Master plan. However, while more than 150 million tons of freight passes through both Morgan and Mountain Green every year aboard trucks on Interstate 84 and aboard the freight trains of the Union Pacific, these operations have little or no impact on the area in question.

Holcim Cement, a significant freight-generating industry, is located just outside the boundary of this study at Devils Slide, Utah. Holcim receives a total of more than 811,000 tons of raw materials for making cement, as well as coal from Utah mines to power the plant, with all inbound materials arriving by truck via I-84. This equates to a total of almost 33,000 trucks arriving at the plant via state-maintained highways each year.

Outbound cement loads total 858,000 tons, with 27% shipped by rail in 100-ton capacity covered hopper rail cars, for a total of 2,316 rail cars shipped. The remaining 73% of the cement produced leaves the Holcim plant by truck. Using the largest cement-hauling tandem trailer trucks, with a total carrying capacity of 40-tons per truck, this would equate to a total of more than 15,500 trucks outbound from the Devils Slide plant each year.

Although not impacting either Morgan or Mountain Green, the Holcim plant is a classic example of how one industry can have a major impact on freight movement and highway infrastructure in a given area.

### **3.5 Bicycle and Pedestrian Conditions**

Mountain Green is connected to other areas by a small roadway network. Although this road network provides a necessary link to the community, it is not as conducive to bicycle and pedestrian traffic as Morgan County would like. There are sections within this network where sidewalk and wider roadways are available, and new subdivision developments are installing sidewalks next to the roadways. These types of improvements have provided a benefit for the pedestrian traffic. However, even with these improvements, most bicyclists traveling from outside of the area do not typically stay in Mountain Green or in Morgan County. More often, bicyclists will start in Mountain Green, but use Trapper's Loop into the Ogden Valley because of the more bicycle-friendly, wide and unobstructed shoulder width of the road.

## **4.0 Summary of Future Conditions**

The future conditions that are presented here are based upon the Mountain Green and Morgan County Master Plans. The future conditions are an estimate of the growth and impact that the current and future zoning and building will have on the area of Mountain Green.

### **4.1 Morgan County Zoning/Planning**

The Existing zoning regulations in Morgan County restrict higher density developments. There is a zoning district that calls for 1- acre minimum lot size within 300 feet from an established roadway. There are districts in the low-lying areas just beyond the 1-acre zone along roadways that require a 20-acre

minimum lot size. There is a zoning district in the foothills requires a 160-acre minimum lot size. Most of the remaining areas of the County, particularly in the mountains, require a 320-acre minimum lot size. This type of zoning has aided the County in preventing “wild-fire” growth and has allowed the County to grow at a relatively moderate rate of about 2.5 percent, annually. However, with the population base of over a million people within about a 30-minute drive of northern Morgan County, quality and responsible growth is a significant concern of the County.

Morgan County is sensitive the effects of future growth. In order to enable the County to carefully consider of the effects of new growth, and evaluate the of impacts of development, Morgan County has adopted a General Plan which guides future development toward cities, towns, and villages. The County also has a Planned Community Ordinance, which allows the County to evaluate the impacts of developments, and enables it to require mitigative measures, including impacts related to traffic.

The County proposes the Mountain Green area to be the focal point of future economic growth and development. Morgan City is also expected to expand its commercial base and residential areas. As future growth occurs, the County is very concerned about the preservation of it rural/agricultural areas. For that reason, the County’s growth will be focused around its cities, towns, and villages. Recreation is also expected to play a significant roll in Morgan County’s future.

#### **4.2 Future Land Use/Population**

Morgan County is located in an area that is referred to as the “Wasatch Back”, which is located on the back side, or east side of the Wasatch Front Range of mountains. In contrast, the “Wasatch Front” lies on the west side of the Wasatch Range. Both of the metropolitan areas of Salt Lake and Ogden/Layton, with a population of about 1.4 million, are situated along the Wasatch Front and in close proximity to Morgan County. There is good freeway access between Morgan County and the Wasatch Front metropolitan areas, and therefore, travel times between work, homes and shopping are usually less than 30 minutes. The excellent access has made it possible form many residents of Morgan County to live in the relative small, undiscovered Morgan Valley, with its rural, small town flavor and majestic alpine mountains. Morgan County has many of the same attributes as the other “Wasatch Back” Counties of Summit and Wasatch, which have experienced rapid residential growth over the past 20 or 30 years. The general trend for the “Wasatch Back” is for continued rapid growth due in large part to the “urban flight” of people trying to escape traffic congestion and the daily grind of the larger metropolitan areas of the Wasatch Front. Therefore, there is no reason not to expect a future wave of residential and other types of growth in Morgan Valley and other parts of the County.

Over the past few years, the Morgan County Planning Department and County Council have been presented with a myriad of development proposals affecting the northern portion of the County. These proposals, most of which have not reached the point where construction could start, are listed in Table 1, below. As the table shows, there are essentially three development components that can be identified if all of the proposals are aggregated. These are: (1) recreational; (2) “bedroom” residential; and (3) commercial (see Figure 1).

The recreational component is associated with future plans to further develop and expand the Snow Basin Resort, which is located just a short drive to the north of the Mountain Green community. Another recreational component is associated with the 14,000-acre Gailey/Holding Ranch, which is owned by Earl Holding of Snow Basin, and others, and has the potential for becoming an entirely new ski destination resort, similar to Snow Basin. These two developments would primarily be comprised of condominiums, hotels and a few homes. Most of the residential development is assumed to be "part time" and as such is expected to have a minority of the owners/renters as full time residents. Nevertheless, Snow Basin expansion could potentially include 1,110 single-family homes, 1,511 condominium units, and 1,860 hotel units (rooms). In addition, 40 commercial units could be included as well. Based preliminary proposals, the Gailey/Holding Ranch could include as many as 500 single family homes, 1,000 condominiums units, and 500 hotel units (rooms).

The largest component of the types of development proposals that have been considered by the County is the so-called "bedroom" residential component. This component is primarily comprised of single family residential and some residential condominium development. Development proposals for the Mountain Green community have included as many as 3,066 single-family homes and 500 residential condominium units. The Wilkinson/Cottonwoods area includes 980 single-family homes. The remainder of the Morgan Valley, which includes Morgan City, Littleton, Stoddard, Milton, Enterprise and Peterson communities would add nearly another 4,500 single family homes.

Along with the residential development component, future development proposals include a commercial development component. The County has designated an area near Mountain Green between the Old Highway and I-84 near the Trappers Loop Hwy. connection to the Old Highway as Mountain Green's "Town Center". This is the area that has been designated to receive most of the county's future commercial business development. Other areas have been identified for commercial business development as well. These are the McMillan area, just east of the "Town Center" area, the Cottonwoods at Mountain Green, which is located to the east and north of the "Town Center", and Snow Basin. These conceptual commercial business development proposals include a total of 320 businesses.

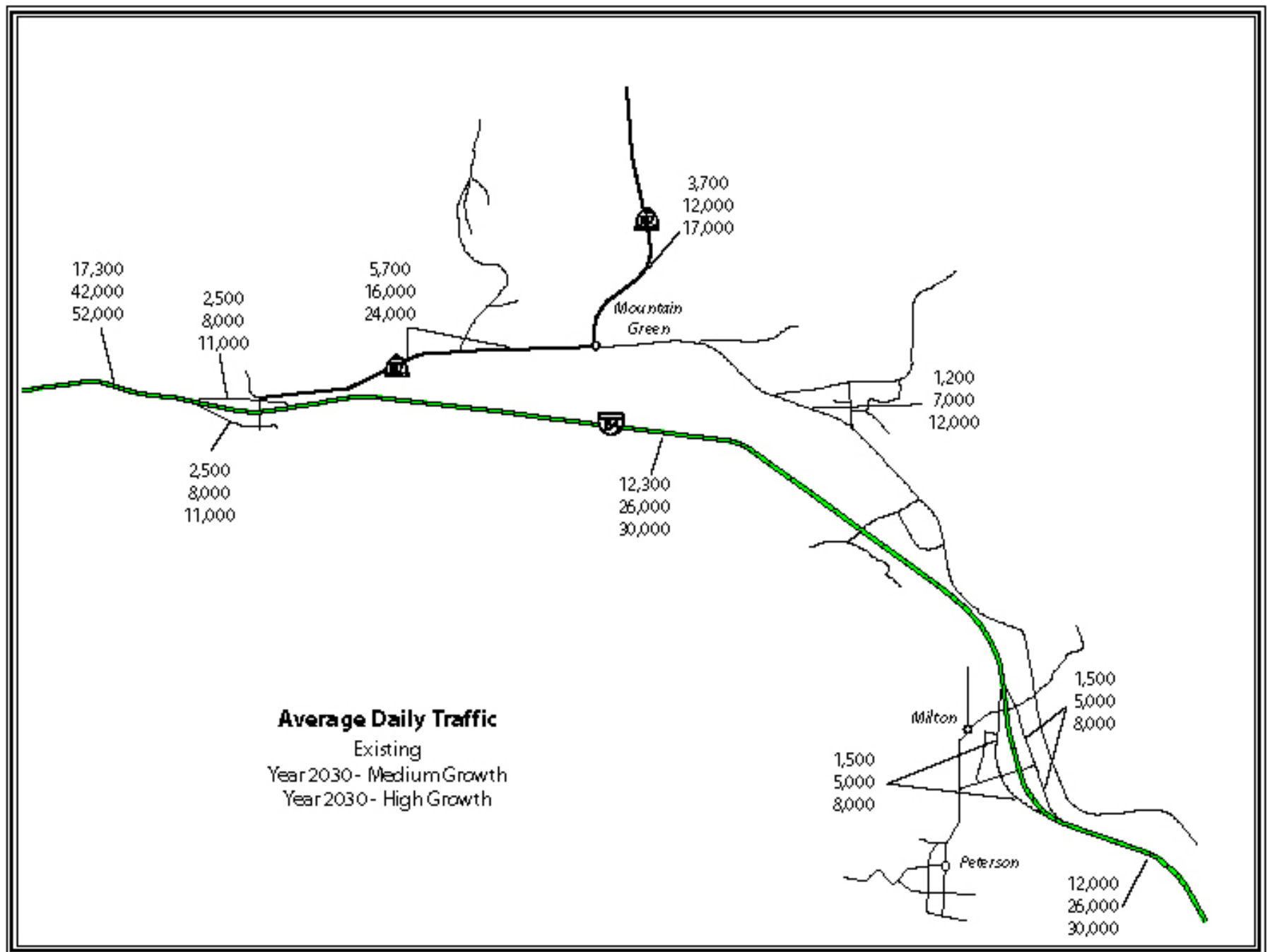
When the various development proposals are considered in aggregate, the number of single family (bedroom) residential units would amount to 10,129, residential condominium units to 3,011, and hotel units to 2,360 units (rooms). If one assumes a dwelling unit occupancy, or family size of 3 for the 10,129 single-family residential units, the population has the potential to increase by nearly 30,400 people. However, since none of the development proposals, except for the Cottonwood at Mountain Green, have been given final approval, it is difficult to estimate at what rate and time frame this residential and other development would occur. If one also considers the 3,011 residential condominiums units, which may have a combination of both full-time and part-time residents, than there is the potential for an additional increase of population. If one assumes 1.5 people per unit, than there would be an additional 4, 500 people. The 2,360 hotel units (rooms) would also house a certain number of people, most of which would be temporary, or short-term. Hotel rooms would add an additional number of people to the county's population.

**Table 1**  
Mountain Green Master Plan  
Land Use and Traffic Generation Summary

<u>Area</u>	<u>Development</u>	<u>Land Use Type</u>	<u>Units*</u>	External Trips per <u>Unit</u>	<u>Total Traffic</u>
Snow Basin Area	Ski Village*	Hotel	740	2	1,480
		Condos	520	3	1,560
	Kent's/Earl's	Hotel	820	2	1,640
		Condos	80	3	240
		Homes	132	6	792
	U.C. Universe	Homes	196	6	1,176
	Strawberry Area	Hotel	300	2	600
		Homes	186	6	1,116
		Condos	380	3	1,140
		Homes	208	6	1,248
		Businesses	40	40	1,600
	North Eastern	Homes	29	6	174
	East Strawberry	Condos	531	3	1,593
		Homes	329	6	1,974
	South Eastern	Homes	30	6	180
	<b>Area Totals:</b>		<b>4,521</b>		<b>16,513</b>
Mountain Green Area	Monte Verde/Strawberry Cr.	Homes	150	6	900
	Highlands/Spring Ranch	Homes	1,083	6	6,498
		Homes	1,000	6	6,000
	Town Center	Businesses	150	40	6,000
		Homes	800	6	4,800
	McMillian	Homes	30	6	180
		Condos	300	3	900
		Businesses	100	40	4,000
	Trappers Point	Homes	50	6	300
	<b>Area Totals:</b>		<b>3,663</b>		<b>29,578</b>
Wilkinson/ Cottonwood Area	Rosehill	Homes	80	6	480
	Browning	Businesses	30	40	1,200
	Cottonwoods	Homes	800	6	4,800
	Bohman	Homes	100	6	600



Figure 2 Traffic Projections



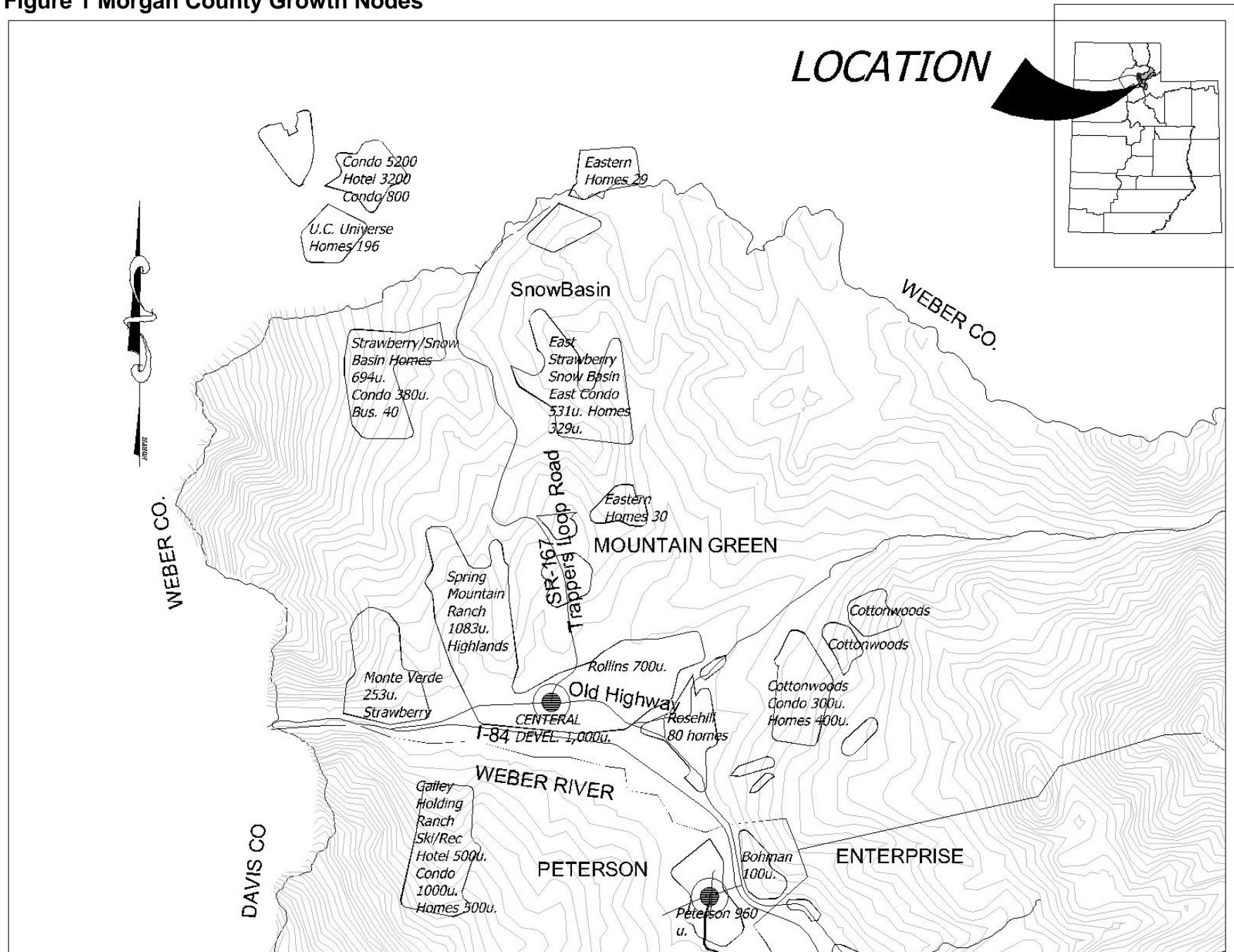
		<b>Area Totals:</b>	<b>1,010</b>		<b>7,080</b>
<b>Total for Mountain Green North of I-84 – Full Build-out:</b>		<b>9,194</b>	<b>Units</b>		<b>53,171trips</b>
<b>50% of Build-out (medium growth):</b>		<b>4,597</b>	<b>Units</b>		<b>26,586trips</b>
Gailey/ Holding New Resort Property	Hotel	500	2		1,000
	Condos	1,000	3		3,000
	Homes	500	6		3,000
	Skiers	750	2		1,500
		<b>Area Totals:</b>	<b>2,750</b>		<b>8,500</b>
Peterson	Homes	960	6		5,760
Enterprise	Homes	253	6		1,518
Milton	Homes	130	6		780
Stoddard	Homes	500	6		3,000
Littleton	Homes	130	6		780
		<b>Area Totals:</b>	<b>1,973</b>		<b>11,838</b>
Morgan City	Homes	2,500	6		15,000
		<b>Grand Totals:</b>	<b>16,417</b>	<b>Units</b>	<b>88,590trips</b>

\* In Weber County

Note: Estimates do not necessarily represent a build-out situation. Growth estimates do not include growth potential of the Ogden Valley.

Source of Land Use Information: Morgan County Planning Department.

Figure 1 Morgan County Growth Nodes



### **4.3 Future Traffic**

Over the past 15 years, traffic in the Mountain Green area has grown at an average rate of about 2½ % per year. Development plans in the area indicate that the growth rate will increase significantly over the next 15 years and beyond. Local government officials provided detailed information on future development. The future land use data indicates that the traffic volumes in the area could increase 200% to 300% over the next 30 years. The table lists the future land use and the potential traffic generated by these developments. At 50% of the total build-out for these projects, about 25,000 new trips will be generated. At 100% build-out as many as 50,000 new trips could be traversing the transportation system. These new trips were distributed on the highway system according to their geographic locations. The following map gives two future traffic volumes for the year 2030 showing a medium growth and a high growth scenario.

The medium growth traffic volumes indicate that both the half interchange at Mountain Green and SR-167 will reach their existing capacities within 30 years. With high growth these facilities will be well over capacity. Trappers loop Road, the county road east of trappers loop and the Peterson interchange will reach capacity under the high growth scenario. I-84 west of Mountain Green will be close to capacity once full build-out of the planned developments is completed.

In summary, the existing transportation system will be in adequate to service the planned development. Capacity improvements will be necessary.

### **4.4 Future Bicycle and Pedestrian Facilities**

Walking and bicycling are important transportation modes that will need to be considered in the overall transportation network, especially with Morgan County's plans to develop into a tourist destination. Embracing this vision, the County realizes the need for expanding bicycle and pedestrian access into and around the Mountain Green area. The Mountain Green Master Plan requires that a map identifying all completed trails, proposed trails, trailheads, and trail type be submitted to the County. As area improvements are planned and implemented, connectivity of trails in Mountain Green, Morgan County and the surrounding areas should play an integral role in the decision making process. In order to provide for a better quality of life for all of those living in Morgan County, the trails will be accessible to all users and incorporate ADA requirements.

The trails systems, as they are planned, designed, and constructed, may have slight variances in application type due to possible differences of the terrain at a specific trail location. However, regardless of the design type, the applicable design standards found in the AASHTO Guide for the Development of Bicycle Facilities should be followed, as well as the MUTCD guidelines for appropriate signage of the trails system.

Bicyclists are allowed on all roadways, except where legally prohibited, and as such should be a consideration on all roads that are being designed and constructed, and as improvements are taking place, such as an interchange

upgrade. Opportunities to include bicycle paths and increased shoulder width in conjunction with a roadway project should be taken whenever technically, environmentally, and financially feasible.

Sidewalks in residential areas should be at least 5 feet wide whenever adequate right-of-way can be secured. This will provide adequate room and a level of comfort to persons walking in pairs or passing and will specifically allow for persons with strollers or in wheelchairs to pass. On major roadways, sidewalks at least 6 feet wide and with a 6 to 10-foot park strip to provide a snow storage area and a buffer to higher speed traffic are appropriate. In pedestrian-focused areas, such as schools, parks, sports venues or theaters, and in hotel and market districts, even wider sidewalks are desirable to accommodate and encourage the higher level of pedestrian activity, especially where tourist use would be expected. As sidewalks are planned and placed throughout the area, the Utah Department of Transportation's approved standard for sidewalks should be followed. This will ensure consistency throughout the Mountain Green area.

## **5.0 Interchange Alternative Analysis**

Maps of the alternatives discussed in this section are included in this report as an illustration of the ideas presented. Any alternative will need to be fully evaluated before any definite alignments can be designed. The first cost associated with any analysis is for the environmental document itself. This cost would range from \$1 million to \$2 million and is not reflected in the planning level cost shown below. The alternatives will be presented here as a preliminary to any larger environmental study in the area for an interchange. An Interchange Justification Report needs to be submitted to the Federal Highway Administration before any interchange can be constructed. The different alternatives are as follows:

- **Alternative 1** – No Build/No Improvements
- **Alternative 2** – West Interchange; improving the existing interchange to a full interchange.
- **Alternative 3** – West Central New Interchange; a new, full interchange east of the existing interchange, west of the area center.
- **Alternative 4** – Central New Interchange; a new, full interchange south of Trapper's Loop Road, which may or may not include two one-way couplets.
- **Alternative 5** – East New Interchange; a new, full interchange east Trapper's Loop Road and northwest of the Peterson Interchange.
- **Alternative 6** – West Interchange Interim Improvements

### **5.1 Alternative 1 – No Build/No Improvements**

Though this alternative is unacceptable to Morgan County and the Mountain Green area, it must be included. With this alternative there would be no construction costs and no environmental impacts to the surrounding area. There are some serious disadvantages to this alternative. If no improvements are made then the Mountain Green area will have limited access for to I-84/I-80 and the emergency vehicles will have a more limited access as well. The "No Build"

alternative will also create a restricted economic development potential for Mountain Green north of I-84.

## **5.2 Alternative 2 – West Interchange**

This alternative would create a full, though unconnected, interchange at the existing west interchange (See Figure 3). The advantages of this alternative are that there would be fewer environmental impacts, reduced conflicts and issues with the railroad, and it is possible to have some interim improvements. The interim improvement would be to add an eastbound on ramp until more could be done in the area.

Yet, there are many disadvantages. The overall access to the area is poor. There are design issues with the frontage road to the north and the topography of the area. The interchange is still not central to the area served. The economic development potential north of I-84 is still restricted. Improvements will need to be done to the Old Highway, or State Route 167, adding to the construction costs. Finally, this would be a non-standard interchange and the Federal Highway Administration may not approve of the design.

The costs for this alternative are from \$4 million to \$8 million. If SR-167 needs to be widened to 5 lanes, the cost would increase \$8 million to \$10 million.

## **5.3 Alternative 3 – West Central New Interchange**

This alternative has two options (see Figure 4). Alternative 3A creates an offset intersection on SR-167. The road would then travel approximately south to I-84 to a new interchange. Alternative 3B would create a full intersection at Trapper's Loop Road (SR-167) and Old Highway then curve to the west before turning to the south to a new interchange with I-84.

The largest advantage of this alternative is that the impacts to the wetlands should be fewer than other alternatives. This would need to be verified during the design stage. Another advantage is a full access interchange.

One disadvantage of Alternative 3A is that it does create an offset intersection between the interchange and northbound Trapper's Loop. The new interchange would be close to the old half-interchange. This distance would be less than 1 mile and it would therefore be unacceptable to keep both interchanges open.

Many options are available for the interchange. Designs costs for this interchange will be shown for two types of diamond interchange and a SPUI. The planning level cost estimates will be summarized in Table 3.

## **5.4 Alternative 4 – Central New Interchange**

This alternative also has two options (see Figure 4). Alternative 4A comes south from Trapper's Loop Road to a new interchange with I-84. Alternative 4B splits the traffic into two one-way couplets. The southbound couplet would come south from Trapper's Loop Road then turns east to rejoin the northbound side. The northbound couplet would curve east then turn north in until it curves back into Trapper's Loop.

Alternative 4B is preferred by Morgan County for the Mountain Green area. The largest advantage of Alternative 4 is that the route is through the center of the area. This will bring a strong economic development potential to the area. A new interchange in this area will be good for emergency services and overall access to the area. The one-way couplets will spread the downtown district, making it larger, with a narrower street cross-section.

The biggest disadvantages are the potential environmental impacts to the area. With an access road to the south, the alternative would cross the center of the wetlands area. The costs of this alternative could be the highest of all the alternatives. Alternative 4B would have the added expense of two roadways through the center of the business district. Lastly, the proximity of the railroad could create many problems right around the interchange.

The planning level cost estimate of Alternative 4, as with Alternative 3, will be summarized in Table 3 of this report.

### **5.5 Alternative 5 – East New Interchange**

Alternative 5 will join the Old Highway with I-84 at a new intersection with a new road. This road can be in one of two locations that will be help to avoid larger environmental impacts to the area (see Figure 5).

The advantages of Alternative 5 are many. The environmental impact potential is lower in this area. Access to the proposed development on the south side of I-84 may be easier to achieve. There are fewer design and topographic limitations for the new interchange and roadway.

Even with all of these advantages, there are some significant disadvantages. There are larger farmland impacts with Alternative 5. The interchange would be out of direction for eastbound travelers to the Mountain Green and Snow Basin areas. Also, the interchange would be in a poor location for the general area of Mountain Green.

With the many potential options for interchange types, the planning level cost estimates will be summarized in Table 3.

### **5.6 Alternative 6 – West Interchange Interim Improvements**

Morgan County officials have identified a need for some interim, or “stop gap” improvements to the existing interchange. With the current interchange at Mountain Green, eastbound access to, and westbound exiting from I-84 is not possible. These movements can only be made at the Peterson Interchange, which is more than 2 miles away to the southeast. This alternative would simply include the addition of an eastbound ramp to I-84. The ramp would approximate 2000 feet in length and would likely cost less than one million dollars. The addition of this ramp would provide more service to the interchange by allowing eastbound access to I-84. The addition of this ramp would eliminate much of the out-of-direction travel that the design limitations of the existing interchange currently causes.

Another aspect to possibly making interim improvements to the existing interchange is access to Morgan Valley south of the Weber River and I-84. In the future, there is a possibility that more development will occur in this part of Morgan Valley and that there will be an increased demand to increase accessibility to that area of the county. The evaluation of the various alternatives has shown that the most practical way to increasing accessibility to this area would be from the existing interchange. There are significant cost and environmental ramifications to building a new full service interchange that would allow I-84 traffic to exit at a new interchange and head south across the railroad tracks, the Weber River and associated wetlands.

This alternative would cost around \$1 million, which is less than Alternative 2

The different types of interchanges and the costs associated with them are summarized in Table 2. The costs will be added for each alternative in Table 3 to give a planning level cost estimate range.

**Table 2**

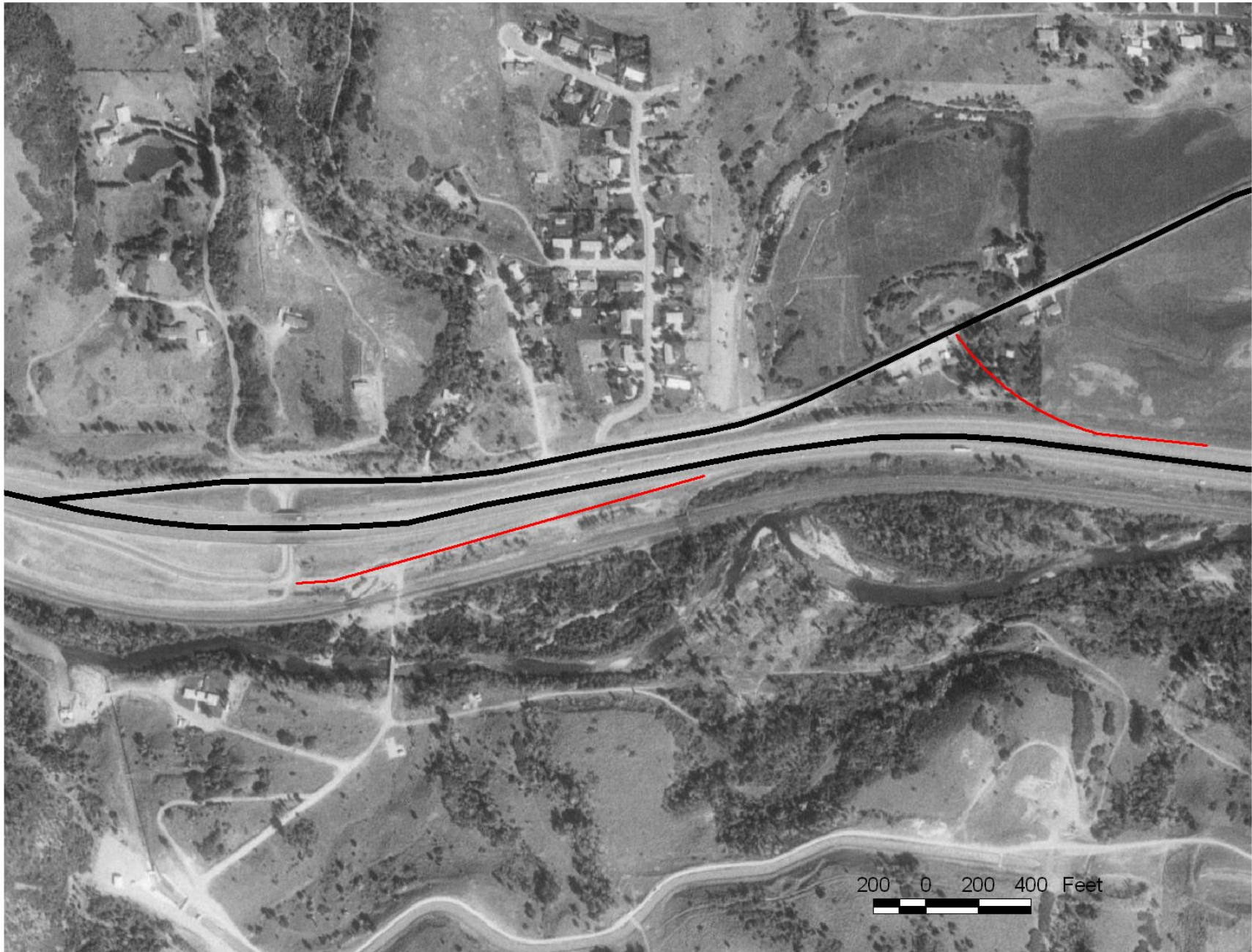
Improvement Type	Cost (in millions)
Tight Diamond Interchange – no mainline or railroad realignment; dual MSE walls for eastbound on and off ramps	\$17 - \$20
Diamond Interchange – no MSE wall; mainline realignment	\$20 - \$25
Single Point Urban Interchange (SPUI)	\$23 - \$28
Single Connector road to Trapper's Loop (SR-167)/Old Highway	\$3 - \$5
One-way Couplets to Trapper's Loop (SR-167)	\$6 - \$8
Access Road to South – requiring structure over railroad, river and wetlands	\$15 - \$40



**Table 3**

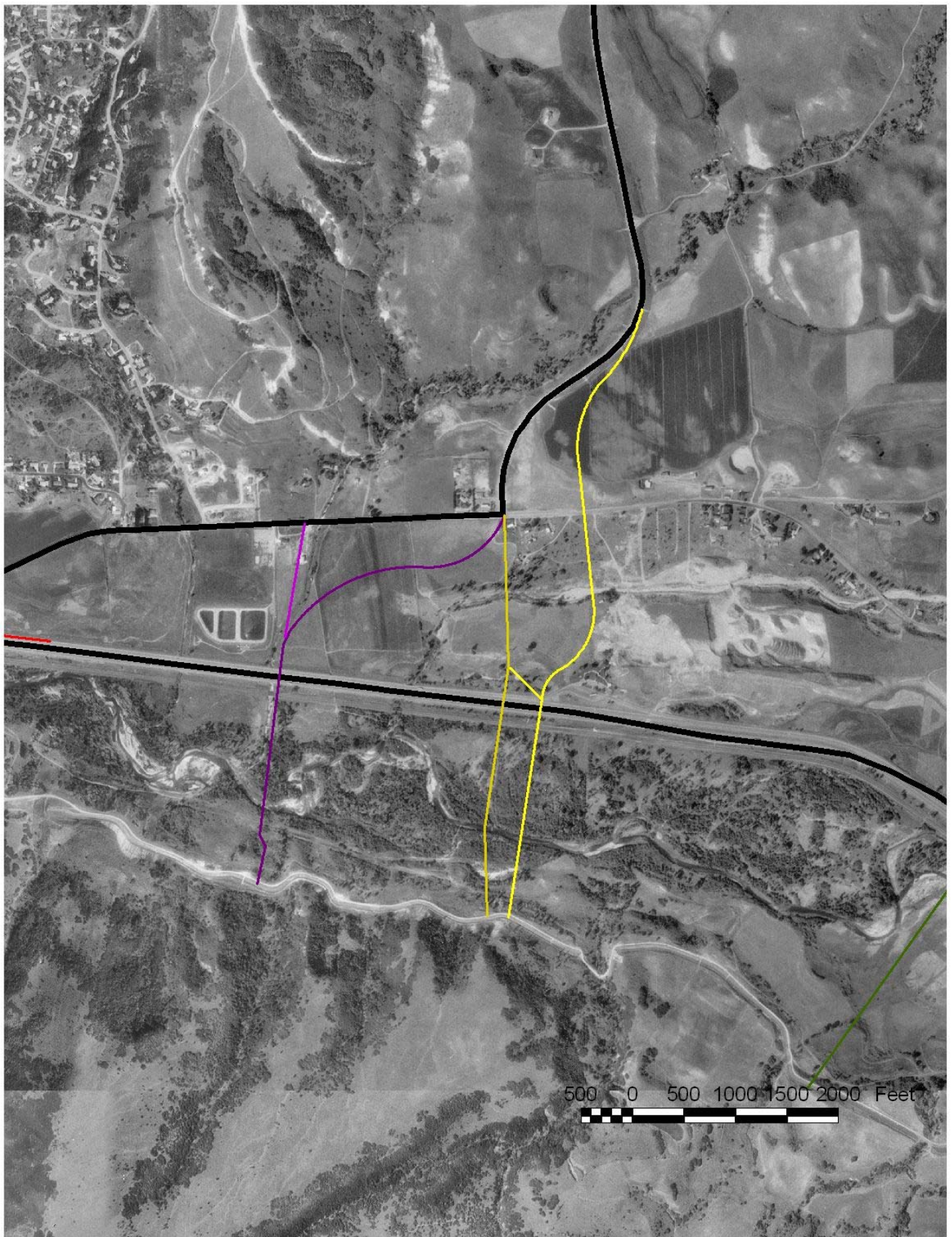
Interchange Alternative	Type of Interchange/Planning Level Cost Range (in Millions)		
	Tight Diamond	Diamond	SPUI
3 – No South Access, With Connector Road	\$20 - \$25	\$23 - \$30	\$26 - \$33
4A – No South Access, With Connector Road	\$20 - \$25	\$23 - \$30	\$26 - \$33
4B – No South Access, With One-Way Couplets	\$23 - \$28	\$26 - \$33	\$29 - \$36
5 – No South Access, With Connector Road	\$20 - \$25	\$23 - \$30	\$26 - \$33
3 – With South Access and Connector Road	\$35 - \$65	\$38 - \$70	\$41 - \$73
4A – With South Access and Connector Road	\$35 - \$65	\$38 - \$70	\$41 - \$73
4B – With South Access and One-Way Couplets	\$38 - \$68	\$41 - \$73	\$44 - \$76
5 – With South Access and Connector Road	\$35 - \$65	\$38 - \$70	\$41 - \$73

Figure 3. Alternative 2



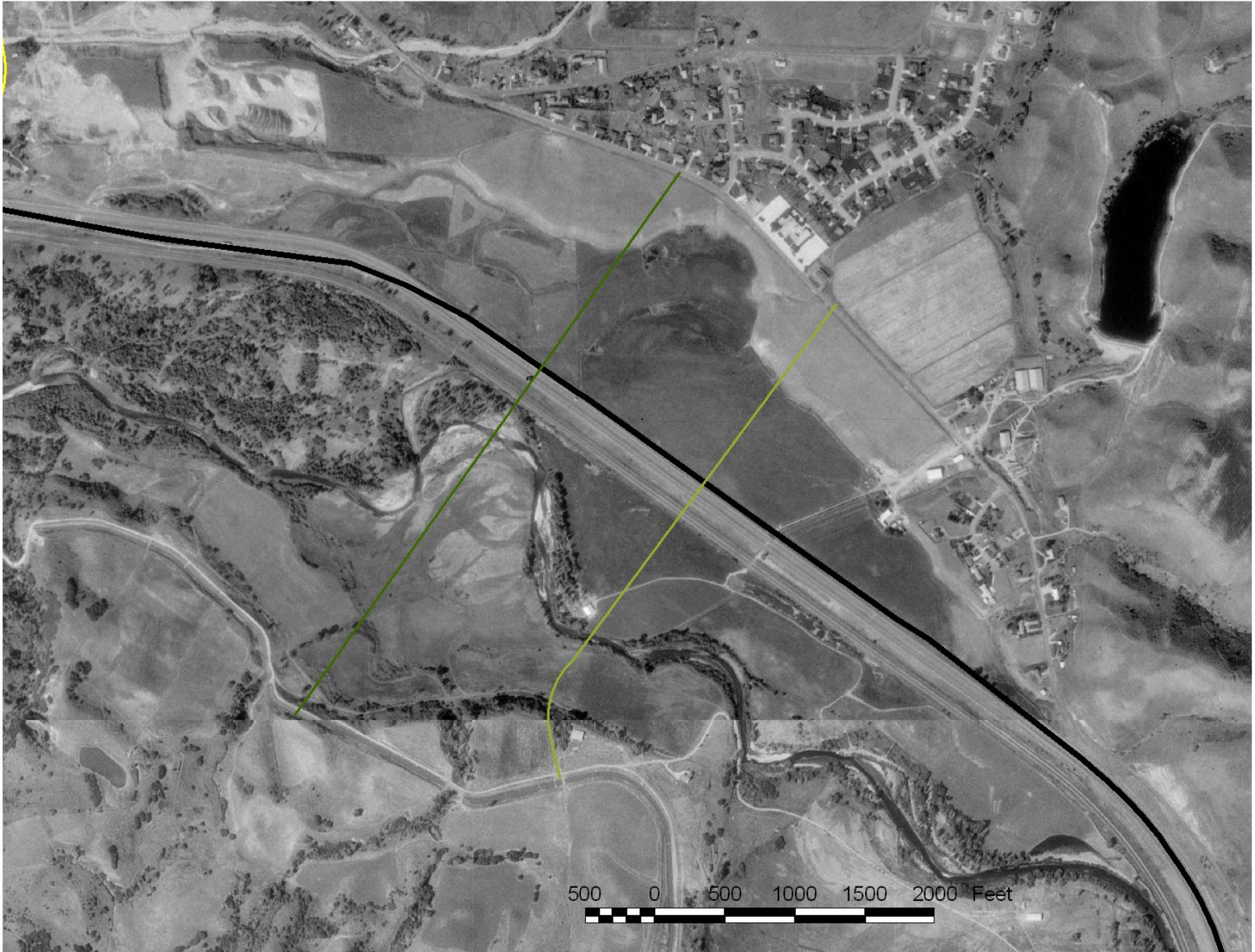


**Figure 4. Alternatives 3 and 4**





### Figure 5. Alternative 5



## 6.0 Federal Requirements

A meeting was held on March 22, 2004 between the study team, some Morgan County elected officials, a representative of UDOT Region 1, and representatives of the Utah office of the Federal Highway Administration. The purpose of the meeting was to obtain information concerning the federal requirements that apply to proposed modifications to I-84 and/or interchange on the Interstate. Discussed was the possibility of a new interchange, and some interim improvements to the existing interchange in the Mountain Green area. Representatives of FHWA recommended that a more detailed analysis of environmental, safety, access, phasing of improvements, and other long term transportation-related issues be conducted in the future relative to the interchange at Mountain Green. They recommended that any new improvements in the Mountain Green area should include a full-service interchange to replace the old interchange that does not provide full service. They indicated that any changes to the existing interchange, or the construction of a new interchange at a different location would require the preparation of an Interchange Modification Justification Report. The requirements that will need to be considered in the preparation of this report are listed below.

The FHWA Policy on Additional Interchanges to the Interstate System (Federal Register / Vol. 55 No. 204 dated October 22, 1990) indicates that federal approval is required for any new or revised access points on the interstate system. (See Appendix -----)

The new access approval process is as follows:

I. The need for a new interchange or a revision to an existing access is determined through the appropriate study or studies.

II. This study information is summarized and the state DOT then submits a request to the FHWA Division Office for approval of the proposed changes. Per a memo dated April 26, 1989 from the FHWA Utah Division to the Utah Department of Transportation (See appendix ----), the change in interstate access request must include at a minimum the following items:

1. Purpose of proposed changes in access
2. Relationships to other highway improvement plans and programs
3. Distances to and size of communities directly served
4. Description of existing and proposed access
5. Description of any proposed or planned local street network improvements
6. Traffic and operational analysis for existing and proposed conditions
7. Other relevant information

III. The FHWA Division & Regional Offices both review the submitted request and forward it on to the FHWA Washington Headquarters with their comments.

IV. The FHWA Washington Headquarters then reviews the entire proposed package and approves or denies the request.

It should be noted that the Federal Planning & NEPA guidelines apply as project funds are programmed, environmental work is completed, and final design work is carried out.

## **7.0 Local Government/Public Involvement**

### **7.1 Local Government Coordination/Stakeholder Meetings**

When the proposal was made to assist Morgan County with some of its transportation and development issues, discussions were held with the Planning Department to obtain agreement on the scope of work of the study. Discussions were also held with the Chairman of the County Council with regard to the study and what it would entail. Requests of the Planning Department for development proposal information and other data, and a "stakeholders" list were made and fulfilled. The list of stakeholders from the county included some of the more significant property owners and developers, the Chair of the County Council, the Planning Director, and some representatives from the Utah Department of Transportation and the Wasatch Front Regional Council staffs. In total, three stakeholder meetings were held in an effort to obtain input from them on the issues, problems, and suggestions on ways the problems and issues could be resolved. A copy of the Rough Draft of the Study Report was provided the stakeholders for their review and comment. Once the initial review comments and other corrections were incorporated into the report, the stakeholders and the County were afforded another opportunity for review and input so that the Final Report could reflect the input and views of the stakeholders.

### **7.2 Local Government Preferences**

The county is very aware of the effects of an efficient transportation system. They are particularly aware of the problems to transportation that new growth in the future could bring. Therefore, the county is very concerned that the operation of the existing I-84 Interchange at Mountain Green continue to function well and not be overwhelmed by new growth in population and traffic. It is the county's desire that the existing interchange function safely and efficiently, and if this cannot be achieved with the existing interchange, that consideration be given to planning of a new interchange on I-84 more in alignment with the Trappers Loop Road. The interchange that would most meet Morgan County's needs and future plans is "Alternative 4", which has been identified and evaluated in this report. In addition, the county would like to coordinate its future land use development in the Mountain Green and other areas with any future transportation improvements that might be made in the future. The county is planning for needed commercial business development in the Mountain Green area, and is interested in establishing a "Town Center" that would be planned around a new interchange more than 1.5 miles from the existing one.

The county realizes the limitation of the existing interchange, particularly that it is fairly antiquated and does not provide full service. School buses and other vehicles many times are required to travel several miles out of their way in order to travel in the eastbound direction from the existing interchange. The county has expressed a desire for a new interchange at some point in the future in order to better serve existing and future transportation needs, and to provide an impetus in fulfilling its plans and hopes for more commercial business development in the Mountain Green area.

The county is desirous of seeing some improvements relative to the interchange situation in the Mountain Green area. It is not satisfied with the status quo, or a “no build” alternative, because of the poor circulation and safety issues associated with the existing interchange. At a minimum, if new interchange improvements are currently not needed, or warranted, the county would like some interim or “stop gap” improvements made to the existing interchange in order to make it safer and more functional. The county has observed that there is currently fill and road base in place for an eastbound ramp at the interchange, but there is no paved surface and it has been blocked with concrete barriers. The County desires the addition of an eastbound ramp to the interchange, and believes it could be easily accomplished, considering that the rudiments of a ramp are already in place. In addition, another interim improvement that the county is in favor of would be the development of a westbound exit ramp via the rest area on I-84.

## **8.0 Recommendations**

After the evaluation of the alternatives and their cursory effects, the results of the stakeholder meetings, and discussions with Morgan County officials, the following recommendations are listed below:

(1) It is recommended that the existing interchange be considered for some interim, or “stop gap” improvements in the near future. First, as was stated previously, the existing interchange is not a full service interchange. Eastbound access to, and westbound exiting from I-84 at the Mountain Green Interchange is currently not possible. These movements can only be made at the Peterson Interchange, which is more than 2 miles to the southwest of the Mountain Green Interchange. This situation creates an inconvenience to the residence of Mountain Green and out-of-direction travel. One of the measures that can be taken to improve the interchange is to further develop the eastbound on ramp. The earthwork for the ramp has been completed, however, there is currently no pavement and it is blocked off with jersey barriers. Development of this ramp would cost very little, and would provide a much needed additional movement at the interchange. Also, at some point in the future, some consideration should be given to the development of a westbound off ramp from I-84 to the Old Highway near Mountain Green. Adding this would provide the opportunity for movements in all directions from the Mountain Green area.

(2) In the long term, it is recommended that consideration be given to the development of a new interchange on I-84 near the point where the Trappers Loop Road, were it extended to the south, would intersect with I-84. This recommendation calls for the development of Alternative 4, which is described in this report. Morgan County’s local officials and the Steering Committee favor this alternative. This alternative is the most compatible with Morgan County’s adopted plans for land use and economic development for the Mountain Green Community. Based on the analysis of the alternatives, it is apparent that a tight diamond interchange would be the most feasible, with no connection to the south, since there are numerous constraints to the south in the form of the railroad tracks, the Weber River, and extensive wetlands and wildlife habitat.

(3) At some point in the future, the establishment, or increased access to the south and west of the Weber River in the Morgan Valley will be needed. It was concluded by the analysis of the alternatives that there would be too much environmental impact to, and project costs by creating a connection to the south from a new interchange, or Alternative 4. It is recommended that if a need for a connection to the south arises, that the existing interchange at Mountain Green be considered for the establishment of such a connection, since it appears that from this action the least amount of environmental impacts would result.

## **9.0 Corridor Preservation and Tools**

In order to be most effective, corridor preservation, or management should be a shared responsibility between the highway agency (UDOT) and the local governments (Morgan County). Each party has certain strengths and weaknesses relative to corridor preservation. The most effective corridor preservation actions that can be taken in the early stages of corridor preservation are those that the local governments have the power to undertake. Local governments are the only governmental entities that have the responsibility to plan future land use/developments. It is during the early stages of site planning and subdivision development review/approval processes that the planned corridor should be considered. Local governments should be resolved to preserve the corridor by making it a part of its General Plan so that the preservation of the corridor has the status of official local government policy. This can be accomplished by incorporating the corridor into the transportation element of the General Plan, or by establishing and adopting an "Official Map".

There will be times when local government ordinances, transfer of development rights, setbacks and other tools will not suffice in preserving a transportation corridor from development. In this case, if the corridor is part of the local government's General Plan, or is on an Official Map, and it is anticipated that construction of transportation improvements are planned to take place within a 30-year time frame, the local government could apply for funds for the acquisition of the property from UDOT's Corridor Preservation Revolving Loan Fund. If the proposal meets the criteria and other requirements of the Fund, financial resource can be made available to the local government to acquire the property if development of the property is immanent and there is nothing more the local government can do to keep the parcel from being developed. Once the project that is planned for the corridor is sufficiently developed, and funding for the project secured, the loan can then be repaid to the Revolving Loan Fund.

There are three main ways that corridors can be preserved. Each of these three main ways has several methods. The three main methods are Acquisition, Exercise of Police Powers, and Voluntary Agreements and Government Inducements.

### **9.1 Acquisition**

One way to preserve a transportation corridor is to acquire the property outright. The property acquired can be developed or undeveloped. When the city is able to acquire undeveloped property, the city has the ability to build without greatly impacting the public. On the other hand, acquiring developed land can be very expensive and can create a negative image for the City. Acquisition of land



should be the last resort in any of the cases for Transportation Corridor Preservation. The following is a list of some ways that land can be acquired.

- Development Easements
- Public Land Exchanges
- Private Land Trusts
- Advance Purchase and Eminent Domain
- Hardship Acquisition
- Purchase Options

## **9.2 Exercise of Police Powers**

Police powers are those ordinances that are enacted by a local government in order to control some of the aspects of the community. There are ordinances that can be helpful in preserving corridors for the Transportation Master Plan. Many of the ordinances that can be used for corridor preservation are for future developments in the community. These can be controversial, but can be initially less intrusive.

- Impact Fees and Exactions
- Setback Ordinances
- Official Maps or Maps of Reservation
- Adequate Public Facilities and Concurrency Requirements

## **9.3 Voluntary Agreements and Government Inducements**

Voluntary agreements and governmental inducements rely on the good will of both the developers and the local government. Many times it is a give and take situation where both parties could benefit in the end. The developer will likely have a better-developed area and the local government will be able to preserve the corridor for transportation in and around the development. Listed below are some of the voluntary agreements and governmental inducements that can be used in order to preserve transportation corridors in the city limits.

- Voluntary Platting
- Transfer of Development Rights
- Tax Abatement
- Agricultural Zoning

Each of these methods has its place, but there is an order that any government should try to use. Voluntary agreements and government inducements should be used, if possible, before any police powers are used. Police powers should be tried before acquisition is sought. The last technique to be used should always be the last resort in any corridor preservation. The Utah Department of Transportation has developed a toolkit to aid in corridor preservation techniques. This toolkit contains references to Utah code and examples of how the techniques have been used in the past.